BENCHMARKING OF QUALITY INDICATORS AND DIMENSIONING OF NURSING STAFF AMONG HOSPITAL UNITS

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BENCHMARKING DE INDICADORES DE QUALIDADE E DIMENSIONAMENTO DE PESSOAL DE ENFERMAGEM ENTRE UNIDADES HOSPITALARES

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BENCHMARKING DE INDICADORES DE CALIDAD Y DIMENSIONAMIENTO DEL PERSONAL DE ENFERMERÍA ENTRE UNIDADES HOSPITALARIAS

João Lucas Campos de Oliveira[1]
Margani Cadore Weis Maia[2]
Ana Maria Müller de Magalhães[3]
Rúbia Marcela Rodrigues Moraes[4]
Michelle Dornelles Santarem[5]
Thamyres Laiz Oliveira Aquino[6]
Samanta de Cassia da Silva[7]

Objective: to perform internal benchmarking of quality indicators and the dimensioning of nursing staff between hospitalization units. Method: cross-sectional study. Nine quality indicators were collected/evaluated by observation sites in the medical (n=450) and surgical (n=274) hospital units of a public hospital in the Midwest, Brazil, in addition to the application of a Patient Classification System for the dimensioning of personnel. Descriptive statistical analysis (in sizing) and inferential (for indicators) were used. Results: there was a significant difference (p-value<0.0001) in the compliance of bed identification (better in the surgical unit) and venous access (better in clinical hospitalization). The quality classification was equitable. The medical clinic presented a deficit of nurses (-11). Conclusion: the quality of care – mediated to the metrics of the indicators – was equitable between the hospitalization sectors and the personnel dimensioning was discrepant, due to the evident deficit of nurses, given the greater complexity of care in the medical clinic.

Descriptors: Benchmarking. Quality Indicators in Health Care. Sizing. Quality Management. Human Resources Nursing at the Hospital. Research in Nursing Administration.

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[1] Nurse. PhD in Nursing. Adjunct Professor at the Universidade Federal do Rio Grande do Sul. Porto Alegre, Rio Grande do Sul, Brazil. joao-lucascampos@hotmail.com. https://orcid.org/0000-0002-1822-2360.

[2] Nurse. Master in Nursing. Assistant Professor at the Universidade Federal de Mato Grosso. Cuiabá, Mato Grosso, Brazil. https://orcid.org/0000-0002-5214-5960.

[3] Nurse. PhD in Nursing. Associate Professor at the Universidade Federal do Rio Grande do Sul. Porto Alegre, Rio Grande do Sul, Brazil. https://orcid.org/0000-0003-0691-7306.

[4] Nurse. Nurse at Hospital Universitário Júlio Müller. Cuiabá, Mato Grosso, Brazil. https://orcid.org/0000-0003-1468-4151.

[5] Nurse. PhD in Epidemiology. Adjunct Professor at the Universidade Federal do Rio Grande do Sul. Porto Alegre, Rio Grande do Sul, Brazil. https://orcid.org/0000-0002-7046-7007.

[6] Nurse. Independent researcher. Cuiabá, Mato Grosso, Brazil. https://orcid.org/0000-0002-3616-2306.

[7] Nurse. Independent researcher. Cuiabá, Mato Grosso, Brazil. https://orcid.org/0000-0002-3443-9666.

Objetivo: realizar benchmarking *interno de indicadores de qualidade e do dimensionamento de pessoal de enfermagem entre unidades de internação hospitalar. Método: estudo transversal. Foram levantados/avaliados nove indicadores de qualidade por sítios de observação nas unidades de internação em clínica médica (n=450) e cirúrgica (n=274) de hospital público do Centro-Oeste, Brasil, além da aplicação de Sistema de Classificação de Pacientes, para o dimensionamento de pessoal. Empregou-se análise estatística descritiva (no dimensionamento) e inferencial (para os indicadores). Resultados: houve diferença significativa (p-valor<0,0001) na conformidade da identificação do leito (melhor na unidade cirúrgica) e de acessos venosos (melhor na internação clínica). A classificação da qualidade foi equânime. A clínica médica apresentou déficit de enfermeiros (-11). Conclusão: a qualidade assistencial – mediada à métrica dos indicadores – foi equânime entre os setores de internação e o dimensionamento de pessoal foi discrepante, em virtude do evidente déficit de enfermeiros, dada à maior complexidade assistencial na clínica médica.*

Descritores: Benchmarking. *Indicadores de Qualidade em Assistência à Saúde. Dimensionamento. Gestão da Qualidade. Recursos Humanos de Enfermagem no Hospital. Pesquisa em Administração de Enfermagem.*

Objetivo: realizar un benchmarking *interno de los indicadores de calidad y dimensionamiento del personal de enfermería entre las unidades de hospitalización. Método: estudio transversal. Nueve indicadores de calidad fueron recogidos/evaluados por los sitios de observación en las unidades médicas (n-450) y quirúrgicas (n-274) de un hospital público en el Medio Oeste, Brasil, además de la aplicación de un Sistema de Clasificación de Pacientes para el dimensionamiento del personal. Se utilizaron análisis estadísticos descriptivos (en dimensionamiento) e inferenciales (para indicadores). Resultados: hubo una diferencia significativa (valor p<0.0001) en el cumplimiento de la identificación de la cama (mejor en la unidad quirúrgica) y el acceso venoso (mejor en hospitalización clínica). La clasificación de calidad fue equitativa. La clínica médica presentaba un déficit de enfermeras (-11). Conclusión: la calidad de la atención – mediada a las métricas de los indicadores – era equitativa entre los sectores de hospitalización y el dimensionamiento del personal era discreto, debido al evidente déficit de enfermeras, dada la mayor complejidad de la atención en la clínica médica.*

Descriptores: Benchmarking. *Indicadores de Calidad en el Cuidado de la Salud. Tamaño. Gestión de la Calidad. Enfermería de Recursos Humanos en el Hospital. Investigación en Administración de Enfermería.*

Introduction

The impulse by means that enable quality of health care and have repercussions on qualified and safe care has been the target in the arena of political and institutional discussions around the world, both because it represents a user's right and because it is an aspect of interest to survival and organizational competitiveness[1]. In this scope, the evaluation is an indispensable tool for productive sustainability. One way to perform the evaluation of organizational performance is benchmarking, which consists of a continuous and systematic strategy of comparing products, services and work processes among organizations recognized as representatives of excellence, with the purpose of continuous improvement[2].

Although the benchmarking be visibly tied to the comparison of metrics among direct competitors, that is, among different organizations, a possibility of their employment is through internal benchmarking, in which the results of indicators are compared between sectors/units/ departments of the same organization[2]. Internal benchmarking emerges as a strategic possibility in the health sector, since the comparison between different institutions is not as widespread as in other branches of production. Moreover, in health, the comparison of indicators usually takes place in a limited-time approach, as shown by research of French origin[3].

Even if it is undeniable the recognition of the need to increase the improvement of the quality and safety of the patient, and also the apparently exponential increase in strategies that favor the processes of continuous improvement – such as benchmarking – there are still several factors that contribute to deficiencies in care that directly impact on these goods, which include important participations of the nursing staff[4-5].

Studies indicate that there is an evident growth in the increase in the workload of the nursing team and direct negative results in the quality of care and patient safety. Regarding

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this, negative results of indicators, such as the mean hospital stay, urinary infection related to invasive procedure, patient satisfaction with nursing care, greater bed occupancy, team work environment, falls, and even mortality have been related to increased nursing workload in studies developed in several countries, such as South Korea[4], Brazil[5], Finland[6], Taiwan[7] and Chile[8].

A way to rationalize the nursing workload is given by adequate provision of human resources, even envisioned by the dimensioning of personnel[9-10]. This is understood as a systematic means of predicting the number of workers adjusted by professional category, required to meet the needs of nursing care, directly or indirectly provided to the clientele, aiming at quality and safety in patient care and safety for workers[9-12]. In Brazil, the parameters for personnel dimensioning are established by Resolution of the Federal Nursing Council (COFEN) nº 543/2017[10]. In turn, quality in health/nursing is usually appreciated by the metrics of indicators [2].

In the dimensioning of nursing staff, methodologies and criteria specific to the care reality should be used that allow the determination of human resources essential to the real needs of care[9-12]. The Patient Classification System (PCS) is characterized as a tool that allows classifying the clientele according to the degree of dependence/level of complexity in relation to the care required by the nursing team. It can also enable the determination of hours necessary for the provision of care in the hospital environment, an elementary variable of personnel dimensioning[12].

In hospitals, it is up to the nurse to daily record the classification of patients according to the PCS, to support the composition of the nursing staff for hospitalization units[10]. The strategic use of PCS also instrumentalizes the work of nursing care management, thus favoring their managerial action in favor of direct care[9-12]. Nevertheless, studies that investigate the dimensioning itself, relating it to the quality of nursing care, are incipient, since research usually correlates results of quality and care safety with workload[5-8]

and not personnel dimensioning. In this sense, it is believed that research comparing the (in) adequacy of nursing staff with measures of care quality is both important and necessary, and can culminate in innovations of a scientific nature (to raise more accurate methods of investigation) and also in practice of quality management and administration of human resources of nursing.

In the face of constantly changing organizational needs and also the importance of studies that use benchmarking in nursing as a way to disseminate this practice of quality management of services, it emerges the social and scientific relevance of investigating more and jointly the dimensioning of nursing staff and the quality of care.

In view of the above, the impulse to answer the following question emerged: Is there a difference in the quality of care expressed by indicators and in the dimensioning of the nursing staff among hospitalization units? Therefore, the aim of this study was to perform internal benchmarking of quality indicators and the dimensioning of nursing staff among hospitalization units.

Method

This is a cross-sectional, descriptive and analytical study, based on the methodology of internal (benchmarking)[2] between hospitalization units. The research was developed in a public university hospital in the Midwest of Brazil, which had 124 beds exclusively linked to the Unified Health System (SUS). The sectors properly surveyed were the hospitalization units in medical and surgical clinic, which had 30 and 24 beds, respectively. The units were chosen by the non-critical mutual hospitalization of adults in the investigation hospital, which was understood as viability for the intended benchmarking.

The research population consisted by hospitalized patients in the referred units, from May to July 2019. There was not sample calculation, since the intention was to reach a census of the eligible population in the established time frame.

The sample was defined in line with the following inclusion criteria: patients over 18 years of age; with orientation preserved in time and space or in the presence of a companion for those with clinical conditions unfavorable to the response and orientation in time and space. Patients under 18 years of age, unconscious and/or without a companion were excluded.

Data were collected in 20 random days during the defined period, through the observation of the patient's hospitalization environment, based on an instrument[13] validated for the survey of quality indicators and the classification of patients. By direct observation, information was extracted for the definition and comparison of nine indicators, namely: patient identification (by bed); identification of the patient (by bracelet); identification of peripheral venous accesses; identification of equipment; identification of serum vials; identification of nasoenteral probe (NET) and/or nasogastric tube (NGT); fixation of the delay vesical probe (DBT); positioning of the DBT collector bag; and positioning of the distal drainage prolongation of the DBT collecting bag[13].

In addition to the observation for the survey of indicators, in order to enable the dimensioning of nursing staff, a Patient Classification System (PCS) was applied to the same patients, which allows classifying the client as to the degree of dependence in relation to the nursing team or level of care complexity[12]. The PCS in question evaluates the patient in the following areas of care: mental status, oxygenation, vital signs, motility, ambulation, feeding, body care, elimination, therapy, cutaneous-mucosal integrity/tissue impairment, dressings and the time used to perform dressings. Based on this evaluation – which generates a score with an interval from 12 to 34 points – patients are classified into one of the following categories: minimum care, intermediate care, high-dependency care, semi-intensive care or intensive care[12].

ComAs was already known, in the surgical clinic unit, in many moments, there are patients who are not in bed, because the surgical procedure itself is being performed, examinations or even

these individuals are walking in the hospital, the number of patients/observation sites (n=57) who were not in the unit at the time of data collection, but were hospitalized in the sector, was adjusted proportionally to the classifications performed by the PCS, in order not to interfere (underestimate) the dimensioning of nursing staff of the unit. This was decided because the application of PCS in the surgical unit was not yet consolidated at the time of the study and, therefore, could make it impossible to recover later documentary data.

Data were collected regarding quality indicators and patient classification was manually performed by two nursing students in the last semester of the undergraduate course. These were previously trained by professor, nurse, doctor and researcher in the nursing management area, as well as a master's master and a master's master and a master's student and a master's student, who followed pilot testing and discussion about possible doubts (for standardization) about the instruments. After that, the data was tabulated in spreadsheets of the Microsoft Office Excel®.

The data analysis was performed using descriptive statistics of indicators according to the percentage (%) compliance, that is, adequacy of each indicator to the standards previously established for its quality compliance, which are based on good practices[13]. In the inferential analysis of comparison of indicators between hospitalization units, the chi-square test with Yates correction was used, using the software R®, version 3.5.3 and confidence interval of 95% of the proportions. In the inferential analysis, the accepted significance level was 5%, expressed in p-value ≤ 0.05.

The indicators were interpreted and compared among the units according to the quality of care, illustrated by a classification of the quality of care according to the conformity of the item/indicator under evaluation, namely: safe care (100%), desirable (99-90%), adequate (89-80%), borderline (79-70%) and insufficient (less than 70%)[13].

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In the analysis of the dimensioning of nursing staff, COFEN'S own equation was applied, according to current regulations[10], such as:

$$QP = THE \times KM$$

Where, QP = Staff (sized nursing staff); THE = Total Nursing Hours; and KM = Marine Constant. KM is a coefficient deducted in relation to: weekly working hours, Technical Safety Index (TSI) and days of the week worked, seven in the hospital environment[10]. It is noteworthy that the TSI represents an additional percentage to the staff to supply the planned and unplanned absences of the nursing team, which should be at least 15%[10].

The KM of choice of each hospitalization unit was the reference to the most prevalent weekly work day in the team, in each sector, assuming 15% TSI. Thus, the KM used in the sizing of the medical clinic unit was 0.2236 (a prevalent weekly working day of 36 h); and in the surgical hospitalization sector, it was 0.2012, because the weekly working day prevalent among the members of the nursing team was 40 hours per week[10].

For the calculation of THE, we used the parameters of nursing hours/day related to each category of classification of the PCS and arranged in the Brazilian norms in force[10], which were multiplied by the daily averages of patients from each of these categories of PCS, according to the period of data collection, and by unit of hospitalization. On the other, the proportion of nurses and middle-level workers in the sized staff took into account the category of care of the PCS that required a higher workload (nursing hours required) in each unit[10].

To verify the number of professionals available in the sectors (said real staff), the work scales of July 2019 were consulted, which were part of the reference period of data collection. This number, which was 41 professionals (8 nurses and 33 nursing technicians/auxiliaries) in the medical clinic and 30 (7 nurses and 23 nursing technicians/auxiliaries) in the surgical clinic, was compared to the respective sized staff.

The study fully respected the ethical recommendations of Resolution nº 466/2012 of the National Health Council. The research is part of a Matrix Project entitled "Nursing Personnel Dimensioning, Quality and Safety Indicators in the Hospital Environment", which was submitted and approved by the Institutionalized Research Ethics Committee, receiving a favorable opinion with protocol nº 3,181,185/2019 and Certificate of Presentation of Ethical Appreciation (CAAE) 07626019.5.0000.5541.

Results

Regarding the quality indicators, the following total values of observation sites were observed, respectively, by indicator: identification of the patient in bed (450 and 274), identification of the patient by wristband (450 and 274), identification of venous access (285 and 164), identification of equipment (201 and 119), identification of serum vials (201 and 119), identification of NET and NGT (50 and 22), fixation of DBT (62 and 52), positioning of DBT collecting bag (62 and 52), and positioning of the distal drainage prolongation of the DBT collecting bag (62 and 52). These are the total baseline values for the conformity assessment of each of the indicators and in each unit of inpatient information described below.

Table 1 illustrates the conformity of quality indicators (i.e., appropriate items), the confidence interval of proportions and analytical comparison by units of hospitalization.

Table 1 – Compliance of quality indicators and confidence interval, by quality indicator and hospital admission unit, and comparison of the conformity of indicators between units. Midwest, Brazil – 2019

(continued)

Indicator	Medical Clinic n (%)	CI 95% (1)	Surgical Clinic n (%)	CI 95% (1)	p-value (2)
Patient identification (Bed)	362 (80.4)	[76.5-84]	260 (94.9)	[91.6-97.2]	<0.0001

Table 1 – Compliance of quality indicators and confidence interval, by quality indicator and hospital admission unit, and comparison of the conformity of indicators between units. Midwest, Brazil – 2019

(conclusion)

Indicator	Medical Clinic n (%)	CI 95% (1)	Surgical Clinic n (%)	CI 95% (1)	p-value (2)
Patient identification (Bracelet)	392 (87.1)	[83.7-90.1]	224 (81.8)	[76.7-86.1]	0.063
Identification of venous access	207 (72.6)	[67.1-77.7]	82 (50)	[42.1-57.9]	<0.0001
Equipment identification	-	-	-	-	-
Identification of serum vials	187 (93)	[88.6-96.1]	118 (99.1)	[95.4-100]	0.025
Probe identification nasoenteral and nasogastric tube	44 (88)	[75.7-95,5]	22 (100)	[84.6-100]	0.217
Fixation of deduring bladder tube	32 (51.6)	[38.6-64.5]	16 (30.8)	[18.7-45.1]	0.039
Positioning of bag collector of delayed vesical bladder	62 (100)	[94.2-100]	52 (100)	[93.2-100]	-
Positioning of the distal drainage extension of the collected bag of delayed vesical bladder	62 (100)	[94.2-100]	51 (98.1)	[89.7-100]	0.092

Source: Created by the authors.

Notes: Conventional sign used:
      - numeric data equal to zero not resulting from rounding.

(1) 95% Confidence Interval of proportions.
(2) Chi-square test with Yates correlation.

Chart 1 summarizes the classification of the quality of care among the indicators, according to their conformities. With this, it demonstrates the comparison/benchmarking by unit of hospitalization.

Chart 1 – Internal benchmarking of nursing care quality indicators, by indicator and unit of hospitalization

Indicator	Quality of Assistance Medical Clinic	Quality of Assistance Surgical Clinic	Best Unit / Equivalence
Patient Identification (Bed)	Proper	Desirable	Surgical Clinic
Patient Identification (Bracelet)	Proper	Proper	Equivalent
Identification of venous access	Borderline	Insufficient	Medical Clinic
Equipo Identification	Insufficient	Insufficient	Equivalent
Identification of serum bottles	Desirable	Desirable	Equivalent
Identification of nasoenteral tube and nasogastric tube	Proper	Safe	Surgical Clinic
Fixation of delayed vesical bladder	Insufficient	Insufficient	Equivalent
Positioning Delay bladder catheter bag	Safe	Safe	Equivalent
Distal positioning bladder catheter	Safe	Desirable	Medical Clinic

Source: Created by the authors.

In turn, Table 2 illustrates the results related to the classification of care complexity, or level of dependence on nursing care, by hospital admission unit.

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Table 2 – Number of classifications and daily average, per hospitalization units and level of care complexity. Midwest, Brazil – 2019

Unit	Minimal care (Average)	Intermediate care (Average)	High dependency care (Average)	Semi-Intensive Care (Average)	Intensive Care (Average)
Medical Clinic	198 (9.9)	95 (4.75)	73 (3.65)	38 (1.9)	46 (2.3)
Surgical Clinic	195 (9.75)	80 (4)	46 (2.3)	5 (0.25)	5 (0.25)

Source: Created by the authors.

The average number of patients in each category/level of care dependence made it possible to measure the nursing hours required daily in the sectors, as illustrated in Table 3.

Table 3 – Nursing hours required daily, by level of care complexity and Total Nursing Hours, per hospitalization unit. Midwest, Brazil – 2019

Unit	Minimum Care Hours	Intermediate Care Hours	Discharge Hours Dependency	Hours of Semi-Intensive Care	Hours of Intensive Care	Total Nursing Hours
Medical Clinic	39.6	28.5	36.5	19	41.4	165
Surgical Clinic	39	24	23	2.5	4.5	93

Source: Created by the authors.

The Total Nursing Hours required in each unit, when being equated together with the reference KM of each sector, determined the sized personnel frames of the nursing staff of the units, which were compared to the actual staff (available on a work scale), expressed in Table 4.

Table 4 – Benchmarking of real and sized staff, by hospitalization unit. Midwest, Brazil – 2019

Nursing Personnel Dimensioning	Royal Picture			Sized Frame			*Deficit / Surplus*	
Inpatient Unit	Nurse	Nursing technicians/ assistants	Total	Nurse	Nursing technicians/ assistants	Total	Nurse	Nursing technicians/ assistants
Medical Clinic	8	33	41	19	18	37	-11	+15
Surgical Clinic	7	23	30	6	13	19	+1	+10

Source: Created by the authors.

Discussion

The results of the indicators illustrated varied quality, since they were classification both in a satisfactory aspect (identification of the patient, positioning of the DBT collecting bag and distal positioning DBT), and unsatisfactory regarding the identification of equipment and fixation of DBT. The difference in care quality among the units was more evident (with statistical significance) in the indicators identification of the patient in the bed and identification of venous accesses, with better results for the surgical clinic unit and medical clinic, respectively.

There is a wide variety of care quality and some equivalence between sectors. In other words, the comparison by internal benchmarking did not clearly indicate the "best" quality of either unit. This result reinforces that quality management practices cannot be punctual, but constant and systematized[1], in order to correct specific failures of each unit and/or metric evaluated and fulfill its role of enabling continuous improvement[3], without reinforcing the punitive culture. It is believed that this assertion strengthens the importance of internal benchmarking performed, because, although general equivalence in the quality of the sectors has been verified, specific aspects were observed, which makes the planning and execution of improvements more feasible.

The comparison of results of indicators is the basic premise of the benchmarking process and something more palatable to institutions that adopt robust quality management models/systems, such as Hospital Accreditation, which can generate an external certification of the quality of services[1]. In a statement, a study with the objective of verifying the association of care indicators and the level of certification of the institutions concluded that the institution with the highest level of certification did not obtain better results among the care indicators evaluated in the research. However, the organization with the highest level of accreditation seal presented important constancy in its results, which was interpreted by the authors as a culture of more strengthened quality[14].

It is note drawn that the identification of equipment is not a practice adopted by the sectors in their routine, being classified as of insufficient quality in both units. In this sense, a study points out that inadequate identification of venous infusion devices may favor the expiration of their respective validity periods, generating quality nonconformity and exposing the patient to a potential risk of complications[15]. It is also known, by clinical practice, that the hospital in question has an internal bundle for prevention of primary bloodstream infection, which addresses practices and care that should be monitored, including the exchange of infusion system at the appropriate time and its corresponding identification.

Most of the serum vials that were in use by the patients presented accordingly, being classified as a desirable quality of care in both hospitalization units. This denotes that, in the institution, nursing team professionals tend to prioritize the identification of some care devices over others, which brings out the issue of standardization of care processes as a means of seeking improvements for such divergences[1].

It is essential that the nursing team incorporates scientific knowledge and practical knowledge about the proper management of vascular catheters and their devices, since these constitute the most used route of administration in the care of hospitalized patients; if they are improperly misbehaved, they may constitute a risk for patient safety[15-16].

The National Health Surveillance Agency (ANVISA)[16] recently guided the clinical conduct for the maintenance and exchange of complementary equipment and devices, indicating that the exchange of these materials should always be performed: in the exchange of venous catheters (peripheral or central); every 24 hours, when the equipment is in intermittent infusions; and if continuous infusion, ideally they should not be exchanged at intervals of less than 96 hours in order to minimize handling and consequent risk of contamination. In addition, the need to replace complementary equipment and devices may be reviewed, depending on the type of solution used, under suspicion of contamination or when the integrity of the product or system is compromised[16].

A study[15] conducted in a philanthropic hospital in the interior of Paraná also observed the identification of serum equipment, finding that 35.85% of them had adequate identification and 39.39% did not have identification. Therefore, approximately 40% of the patients were using devices that did not meet the quality and safety criteria[15] This is said to be the role of the nursing team in maintaining/caring for these devices in a standardized manner, because inadequate

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practices can expose the patient to the risk of infections and adverse reactions, in addition to increasing costs and hospitalization time[16].

It is postulated that the standardization of conducts/processes, in the scope of nursing care, is not a legitimate guarantee of care quality, but, in managerial terms, it is an important guide for the systematic verification of nonconformities that can be improved in the troubled daily work.

The previous assumption reinforces a recent study[17] developed in the state of São Paulo, which pointed out that the opinion of 247 nursing workers states that the use of Standard Operating Procedures (SOP) enables the provision of standardized care and in accordance with technical-scientific parameters supported. However, in the same research, it was identified that the deficiency of human resources would be the main barrier to the implementation of these standardization tools[17], which, in a way, has some relationship with this study, especially in the medical clinic unit, in which the deficiency of nurses (ideally the care manager and, therefore, a possible actor more adherent to standardized practices) was large. Nevertheless, it is prudent to admit that the teams, in the general framework, did not present personnel deficit, at least through the sizing method employed.

Regarding observations regarding peripheral venous accesses (PVA), these presented results of borderline quality in the medical clinic and insufficient in the surgical clinic. Aiming at the best quality of customer service, it is recommended that, in adults, the peripheral catheter should not be changed in a period of less than 96 hours, when it is in appropriate conditions, among them: suitable insertion site and constantly evaluated for phlogistic signals; integrity of the skin and blood vessel; type and duration of prescribed ongoing venous therapy; in addition to the integrity, permeability of the device and adequate maintenance of the coverage[16].

Regarding the indicator "fixation of the bladder probe of delay", there is an inadequate quality standard in the care between the two units, however, with regard to the prolonged and distal positioning, they are classified as safe (adequate). Thus, the non-conformity for catheter fixation of the tube, classified as insufficient, constitutes a risk of adverse event, having a close relationship with the chance of traction of the bladder catheter, which may cause trauma to the urethra during the mobilization of the patient, in addition to the ascending migration of pathogens when there is the movement of the catheter to the bladder, situations that significantly increase the risk of urinary tract infection[18].

Regarding the indicators of identification of the patient, both by the bed and by wristband, potential improvement was found. The purpose of correctly identifying the patient is to reduce the occurrence of incidents, ensuring that care is provided to the person for whom it is intended[19-20]. Through the use of identifiers (currently recommended preferably through wristband), the risks of errors in service are minimized. The bracelets must be white, with identification of at least two identifiers, such as full name, mother's name, date of birth and attendance number[20].

Although there was a statistically significant result for the indicator of identification of the patient in bed, with better compliance in the surgical clinic, the medical clinic adhered more to the identification by means of a wristband, which is considered a safer practice[20]. It is reinforced that the continuous monitoring of the accession to patient identification is consistent with the increases in care safety. In this study, it seems to be an indicator that still needs consolidation in both units, although both presented much better results when compared to the medical-surgical hospitalization of a public university hospital in southern Brazil (63.9%)[19].

Following the parameters of COFEN Resolution nº 543/2017[10], 19 nurses would be needed in the medical clinic staff to meet the needs of care demand. The actual number of nurses presented a deficit of around 60% on the projected condition, which may imply the work overload in the category and/or deviation of their functions on direct care to the patient, given its greater complexity/level of dependence. Overload, in turn, is an important problem in the

professional health of nurses, such as stress and exhaustion. One of the most common problems found in the study was occupational stress, which may negatively imply the quality of care in workers' health[21].

An investigation in 11 Intensive Care Units in the capital of São Paulo, with the objective of verifying the correlation between nursing care time and care quality indicators, did not find significant correlations, although the authors made pertinent allusions regarding the interrelationship between these variables[22]. In addition, although the correlation between the indicators and the dimension was not the object of this study and, yes, the comparative benchmarking, in descriptive terms, it seems that there was no difference in the quality of care in relation to the quantity of projected/real personnel. This is because the totality of care quality can be interpreted as equitable between units. On the other hand, the comparison of the team size and the respective real staff, the deficit of higher-level personnel in the medical clinic was evident compared to the surgical clinic, which antagonically presented a higher personnel surplus.

It is also prudent and necessary to mention that, even if the surgical clinic unit presented a higher personnel surplus and did not present an evident deficit, as in the medical clinic, in this sector, the workers worked – in a larger portion – for 40 hours per week, which, of course, requires a smaller number of staff, comparing to the 36-hour journey of the medical clinic sector. About this, it is necessary to admit that the dimensioning in the medical clinic was misadjusted to the exclusive logic of the current parameters of COFEN. However, the workload measured, for example, by the volume of patients assigned per worker, as already used as an important metric to be correlated with quality and safety indicators in another national study[5], it is a factor not considered in this study, which chose to follow a standardized evaluation logic, which was eminently comparative in terms of parallel between two units. That is, other measures of workload besides the PCS

and the weekly working hours (culminating in sizing itself) could elucidate more and better the correlation of the adequacy of human nursing resources with the quality of care in the sectors, which is a suggestion for future research.

There is difficulty in establishing direct relationships between the general number of nursing staff projected/sized on measures of quality of care and patient safety. Perhaps, for this reason, some recent studies use the ratio of patients per nursing professional as a parameter to be associated with the metrics of interest, in which it is demonstrated, both in Brazil[5] and in the United States of America[23], that the reduction in the volume of patients assigned to nursing workers or the greater volume of staffing to serve a clientele tends to favor better results with sensitivity of having their quality verified.

The high deficit (-11) of nurses associated with the surplus (+15) of mid-level staff found in the dimensioning of the medical clinic unit is a finding already mentioned[9,11] when investigating hospitalization units, where the degree of dependence on care is high, as was verified in this sector. However, again, it is rethought that the quality of care was equivalent among the units, which leads to the reflection that, in addition to the need to review the staff, the planning and quality control initiatives themselves contain spaces for improvement, which in itself is a contribution of the study to nursing management practice with a focus on the quality of care.

The exposed findings, linked to the scientific literature, refer to a necessary reflection of Brazilian nursing, in order to discuss the guidelines of the representative organs of the profession and the reality of hospital services. As in other studies mentioned, the total number of mid-level professionals approaches or even exceeds that recommended by the current regulations of COFEN. However, the deficits are concentrated in the number of nurses, which indicates the urgency to rethink the work processes and the greater insertion of nurses in direct care, with the objective of qualifying care,

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especially that dispensed to clients with a higher level of complexity.

Thinking about reducing the total number of the nursing team to meet the projected demand of nurses, as suggested by the dimensioning of the medical clinic unit in particular, but also of the surgical, is certainly a great taboo and challenge, both from the perspective of workers, who could feel harmed, as well as, perhaps, to patient care. Therefore, it is verified that this complex reality is up to nursing leaders to equate and also enable good working conditions for the team and, consequently, of nursing care.

To seek better alternatives to the exposed situation, a prolonged period of analysis of the care complexity of patients would be necessary. Moreover, a more systemic view of the reality of workers, such as age, turnover rates and absenteeism, among others, and also inherent (and therefore peculiar) aspects to the work process in each hospital unit would also be indispensable.

In the dimensioning of personnel, in addition to the degree of dependence on care of the clientele, one should consider characteristics of the service/health institution and also of the nursing service[10]. In a way, this is a point that causes the objects of this study – the quality of care and the dimensioning of personnel – investigated together, to gain even more relevance, because it is perceived that, even with teams, at first with a surplus of nursing staff, the quality of care has evident spaces for advancement/improvement, which denotes characteristics of the health and nursing service that go beyond the issue of the number of available personnel.

The equivalence in care quality envisioned in the evaluation by the indicators, the clear deficiency of nurses in the medical clinic unit and the surplus of staff in the surgical clinic possibly reflect that the adequacy of personnel is not an isolated factor in the qualification of care. The hypothesis arises about supervisory models – organizational and care –, the adoption of standardized processes, the systematic and periodic evaluation of care and related resources for its production and the professional ethics

itself that are factors with repercussions (positive or not) on the quality of care. However, the rationalization of the workload and the adequacy of personnel in relation to care demand certainly deserve to be continuously (re)planned by nursing managers committed to qualified care and to the workers themselves.

It is believed that the greatest limitation of this study is the absence of a robust statistical correlation between care quality and the dimensioning of nursing staff and/or workload. Nevertheless, the research contributes to the advancement of knowledge in nursing quality management and human resources management, in addition to disseminating (in nursing, which is not adhering) benchmarking as a feasible and consistent strategy for planning the improvement of care processes and also of people management.

Conclusion

It was concluded that the quality of care – mediated by the indicators analyzed – among the hospitalization sectors was equitable and the personnel dimensioning was discrepant, since the medical clinic team had an evident deficit of nurses given the greater complexity of care. However, it is prudent to emphasize the longer weekly working hours in the surgical clinic team compared to the medical clinic, which attributed a reduced number in the forecast of the sized staff in this sector. This reinforces that the correlation between the quality of care and the dimensioning of nursing staff deserves further investigation and integration.

Although the research is restricted to a punctual locality, it is believed that the study contributes to scientific advancement, by raising the need to increase methods that enable parallel scare quality with the provision of nursing human resources, either in a correlational way, that is, by eminently comparative means, as in the case of the benchmarking performed, which goes beyond the local interest. Above all, the study is a possible sign that improving the quality of care is a complex goal that should take into account not only the adequacy of personnel, even if this

aspect is undeniably relevant or even protagonist for its scope.

Collaborations:

1 – conception, design, analysis and interpretation of data: João Lucas Campos de Oliveira, Margani Cadore Weis Maia, Thamyres Laiz Oliveira Aquino and Samanta de Cassia da Silva;

2 – writing of the article and relevant critical review of the intellectual content: João Lucas Campos de Oliveira, Margani Cadore Weis Maia, Ana Maria Müller de Magalhães, Rúbia Marcela Rodrigues Moraes and Michelle Dornelles Santarem;

3 – final approval of the version to be published: João Lucas Campos de Oliveira, Margani Cadore Weis Maia, Ana Maria Müller de Magalhães, Rúbia Marcela Rodrigues Moraes, Michelle Dornelles Santarem, Thamyres Laiz Oliveira Aquino and Samanta de Cassia da Silva.

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